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the special features mentioned are the following: The tide wave advances progressively from south to north on the west coast of Europe, but arrives simultaneously along a great stretch of eastern North America. It advances northward on the east coast and southward on the west coast of New Zealand, but arrives all at once on the eastern coast of Australia over a belt covering 26 degrees of latitude. Spring tide is delayed from half a day to two and a-half days after new moon at most Atlantic stations, but at Toulon, on the Mediterranean, it occurs  $4\frac{1}{2}$  hours before the syzygies. The diurnal inequality, which should reach its maximum with the greatest declination of the moon, is belated on the European coast by from four to seven days, while at one point in the Gulf of Mexico it is accelerated by 17 hours. Much consideration is given to Boergen's discussion of interfering waves, whereby the notable differences between the tides of oceanic islands may perhaps be accounted for. The once-a-day tides on lunar time in the Gulf of Mexico and on solar time at Tahiti and elsewhere are thus to be explained. The studies of George Darwin and Lord Kelvin in the modifications suffered by the tide waves when running ashore have shown that 'overtides,' having shorter periods than normal tides, may be thus produced, and these are compared with the overtones of musical sounds, as explained by Helmholtz. The three tides in a day in the Tay at Stirling, Scotland, and in the harbors back of the Isle of Wight are thought to be of this nature. The continuous records of tide gauges reveal an increasing number of stations at which waves of short periods, from 5 to 90 minutes, are found, the shortest of these being much longer than the longest period of wind-made swell (12 to 15 seconds). Some of these oscillations, as in various arms of the Mediterranean, are probably to be compared with the seiches of lakes. W. M. DAVIS.

#### CURRENT NOTES ON ANTHROPOLOGY.

##### 31ST PEABODY MUSEUM REPORT.

THE thirty-first report of the Peabody Museum of American Archæology and Ethnology describes the progress of its explorations and collections. Those in Central America were continued under the care of Mr. George Gordon. He examined various caves but did not find in them any objects of great antiquity. The collections of casts have been enlarged, but there remains much which the museum could do in this line if it had more funds. Mention is made of the liberality of the Duke of Loubat, of Miss Breton and others. Miss Whitney has given to the Museum the famous 'Calaveras skull,' together with the objects found around it. The general activity indicated by the Report continues to reflect the highest credit on the curator, Professor F. W. Putnam.

##### THE AIMS OF ETHNOLOGY.

A SUGGESTIVE address was recently delivered before the Batavian Society of Arts and Sciences by Professor Bastian, who is making a prolonged journey in the Orient. His subject was 'The Purposes of Ethnology.' The style is simpler than is usual with this celebrated master, and his matter is highly suggestive. He emphasizes the principle that ethnology concerns itself only with man as a social being, and that he derives all his worth from the others with whom he lives. The elementary thoughts of savage tribes should occupy our first attention. From these we should trace the ethnic modifications which arise in the course of development. They stand in close relation to geographic conditions, which are always the leading factors in ethnic evolution. These thoughts are well brought out in Professor Bastian's address.

##### THE ARAUCANIAN TONGUE.

THE twenty-first volume of the Library of American Linguistics, published in Paris,

is taken up with a comprehensive grammar and dictionary of the native language of Chili, called by some the Araucanian, but in this instance the Auca. The author is Mr. Raoul de la Grasserie. His treatise occupies 372 pages and embraces a large number of texts. To these he adds a literal translation and a grammatical analysis. His previous studies on American languages and on the philosophy of language in general guarantee his accuracy and thoroughness. He has used the moderately abundant writings of previous scholars with judgment, and throws new light on several points heretofore obscure in the construction of the tongue. (Langue Auca, Paris, 1898, J. Maisonneuve.)

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#### NOTES ON INORGANIC CHEMISTRY.

At a meeting of the Institution of Civil Engineers (Great Britain) held March 15th Mr. Henry Fowler read a paper on 'Calcium Carbid and Acetylene,' which summarized the present knowledge of the subject. From the full abstract in *Nature* we note the following: As the power theoretically required to produce one pound of calcium carbid in the electric furnace is more than 2 H.P. hours, its manufacture is at present restricted to localities where power is cheap, as, for instance, where water-power is available. The acetylene flame has a high actinic value, and causes light colors to appear lighter and dark colors darker than when exposed to sunlight. The gas, when inhaled, combines with the hemoglobin and renders the blood incapable of taking up oxygen; it is no more dangerous, however, in this respect than coal gas. With calcium carbid at \$80 a ton, acetylene can compete with coal gas at 62 cents per thousand feet, where flat flames are used for the latter, and a light of not less than 30 candles is required. It

is now used for lighting a station on the Great Southern and Western Railway of Ireland, and at the Salford Docks of the Manchester Ship Canal. Its price prevents its use for gas-engines. It cannot be used economically to enrich coal gas, as with low percentages the increase is not above 1 candle-power for 1 per cent. acetylene. With water gas it is even less applicable, as more than 10 per cent. is required before any illumination is obtained. Methane and nitrogen are claimed to carry the gas without affecting its illuminating power.

THE subject of the Watt Memorial lecture, delivered March 11th at Watt Memorial Hall, by Professor Thorpe, was 'James Watt and the Discovery of the Composition of Water.' The honor of this discovery, which is one of the landmarks of the history of chemistry, has been shared by Cavendish and Lavoisier, but Professor Thorpe shows that Watt, whose connection with the discovery has been generally regarded as incidental, in writing to Priestley, April 21, 1783: "Are we not, then, authorized to conclude that water is composed of dephlogisticated (oxygen) and inflammable (hydrogen) air or phlogiston deprived of part of their latent heat," was the first, as far as we can prove from documentary evidence, to state distinctly that water is not an element, but is composed, weight for weight, of two other substances, one of which he regarded as phlogiston and the other as dephlogisticated air. It was on June 25th following that Lavoisier announced his discovery to the Academie des Sciences, while Watt's letter to Priestley was published with another letter of his in the *Philosophical Transactions* as having been read on April 29, 1784. In reality, however, Watt antedated Lavoisier more than two months.

THE rare element gallium has been found by Professor Hartley and Mr. Hugh Ramage to be very widely distributed in the earth